

UMaine Engineering *Innovating our Economic Future*

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UMaine Engineering *Vital to Maine's Future*

- Engineering in Maine's economy
- Engineering education in Maine
- UMaine Engineering

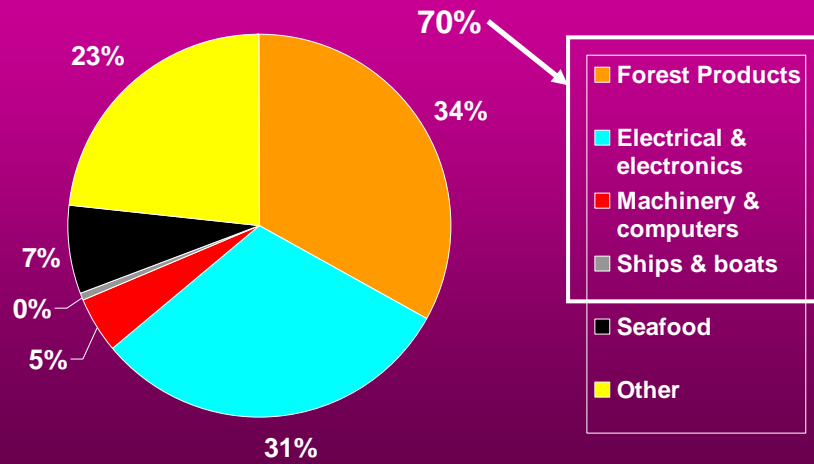
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Role of Engineers in the Economy

- "If you want good manufacturing jobs, one thing you could do is graduate more engineers."
- Jeffery Immelt, CEO General Electric
- "More S&P 500 CEOs obtain their bachelors degree in engineering than in any other field."
- National Academy of Science, 2007
- "In the emerging economy of the new century, the team with the most engineers wins ."
- Neil Freeman, Director
Maine Heritage Policy Center

Maine's Major Export Commodities, 2006



Source: Maine Development Foundation

Value Added

Industry	\$ per employee
Accommodations & food services	\$45,000
Health care	\$66,000
Engineering	\$105,000
Manufacturing	\$200,000

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Health care	\$66,000
Engineering	\$105,000
Manufacturing	\$200,000
Paper manufacturing	\$387,000

Maine Engineering Innovation

Cianbro – Amethyst
Semi-Submersible
Oil Drilling Rigs



RF Technologies –
microwave preheater
for laminated wood
products



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B.S. Engineering Degrees in Maine by Institution ('05-'06)

Institution	# of B.S. degrees
UMaine	154
USM	16
MMA	2

90%

100% of engineering graduate
degrees are from UMaine

Where do engineering graduates go?
Brain drain – fact or fiction?



Where do engineering graduates go?
Brain drain – FICTION!!!!!!!

- 2/3 of in-state engineering graduates get their first job in Maine
- 1/3 of out-of state engineering graduates get their first job in Maine

B.S. Engineering Degree Production in Maine

Academic Year	# Degrees	Degrees per million population	Rank
'90-'91	157	128	48
'00-'01	149	117	50
'05-'06	173	131	49

Source: Engineering Trends

B.S. & B.A. degree production in Maine (*all majors*)

- Maine awarded 5132 B.S.&B.A. degrees per million population
- vs. national average of 5271 per million
- Maine ranks #31 in per capita production of B.S./B.A. degrees

Source: IPEDS

Maine Graduate Engineering Degree Production (05-06)

- M.S. degrees
 - 22 degrees/million population
 - Rank #51
- Ph.D. degrees
 - 4.5 degrees/million population
 - Rank #49

Source: Engineering Trends

Engineering Workforce in Maine

- Maine's annual B.S. degree graduates are 3.5% of engineering workforce
- Nationwide annual B.S. engineering graduates are 5.1% of engineering workforce
- Maine is in 4th quartile of engineers as percent of workforce
- Are we graduating enough engineers to even maintain current (inadequate) engineering workforce?

Source: U.S. Dept. of Labor & National Science Foundation

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B.S. Degrees at UMaine

- Engineering
 - Civil
 - Mechanical
 - Electrical
 - Engineering Physics
 - Computer
 - Chemical
 - Biological
- Engineering Technology
 - Construction Management
 - Surveying
 - Mechanical
 - Electrical

Graduate Engineering Degrees at UMaine

- Masters
 - Civil
 - Mechanical
 - Electrical
 - Engineering Physics
 - Chemical
 - Biological
 - Spatial
- Ph.D.
 - Civil
 - Mechanical
 - Electrical
 - Chemical
 - Spatial

Enrollments (Fall'07)

Department	Enrollment
Engineering Technology	376
Civil and Environmental	300
Mechanical	232
Electrical and Computer	216
Chemical and Biological	138
Spatial Information Sci & Eng	50
Engineering Physics	33
General Eng & Undecided Eng	89
TOTAL	1,434

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101 chemical & 37 biological engineers

Engineer of the Future

- “Engineers need to work in teams, communicate with multiple audiences, and immerse themselves in public policy debates and will need to do so more effectively in the future.”

•(The Engineer of 2020,
National Academy of Science, 2007)

Engineer of the Future

“... a significant number use their engineering backgrounds as points of departure into other fields such as law, medicine, and business. The opportunities offered by an engineering education are multifold ...”

•(*The Engineer of 2020*,
National Academy of Science, 2007)

B.S. Engineering Plus ...

- Minor
 - Engineering Leadership and Management
 - Innovation Engineering
 - Engineering Entrepreneurship
 - Business Administration
 - Public Administration
 - Foreign Languages
 - Biomedical Engineering

B.S. Engineering Plus ...

- Dual Degree
 - 3+2 program with Bowdoin College
 - 5 yr. B.S./B.A. at UMaine
 - 5 yr. B.S. + MBA at UMaine
 - More collaborations in the works ...

Engineering Leadership and Management Minor

- GEE 230 Intro. to Engineering Leadership and Management
- Two leadership courses
- One communications course
- One decision making course
- GEE 430 Engineering Leadership and Management Internship

Summary

- Engineers are essential to Maine's economy
- Maine lags the nation in production of engineers
- Growth of Maine's economy requires a healthy supply of engineers
- UMaine engineering is critical to Maine's economy
- UMaine need to double UMaine engineering
- Investment in engineering education and R&D is an investment in Maine's future

Thank you for your attention



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